

Thrombolytic agents

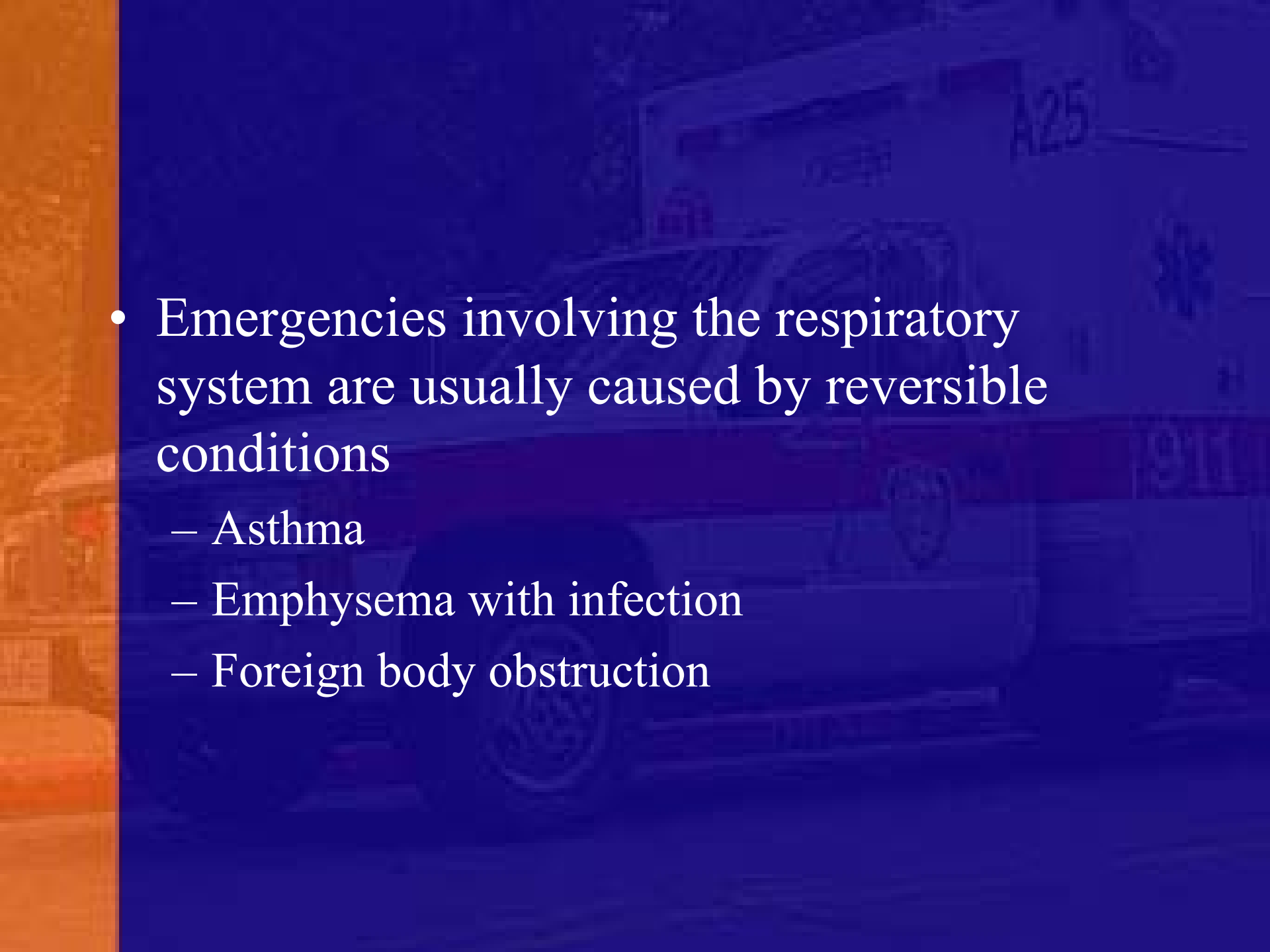
- Examples
 - Anisoylated plasminogen streptokinase activator (APSAC)--Anistreplase (*Eminase*)
 - Streptokinase (Streptase)
 - Urokinase (Abbokinase)
 - Tissue plasminogen activator (t-PA, Alteplase)



Drugs used to affect the Respiratory System

- Drugs that affect the respiratory system are useful for several purposes
 - Asthma
 - Also includes:
 - Cough suppressants
 - Nasal decongestants
 - Antihistamines

- Serious narrowing of any portion of the respiratory tract may be an indication for pharmacological therapy

- 
- Emergencies involving the respiratory system are usually caused by reversible conditions
 - Asthma
 - Emphysema with infection
 - Foreign body obstruction

- Smooth muscle fibers of the tracheobronchial tree directly influence the diameter of the airways
 - Muscle tone is maintained by impulses from the autonomic nervous system

- **Parasympathetic** fibers from the vagus nerve innervate bronchial smooth muscle through the **release of acetylcholine**
 - **Producing bronchoconstriction**

Table 9-5

Receptor	Response to Stimulation	Location
Alpha 1 (α_1)	Constriction Constriction Mydriasis Ejaculation	Arterioles Veins Eye Penis
Alpha 2 (α_2)	Presynaptic terminals inhibition*	
Beta 1 (β_1)	Increased heart rate Increased conductivity Increased automaticity Increased contractility Renin release	Heart Kidney
Beta 2 (β_2)	Bronchodilation Dilation Inhibition of contractions Tremors	Lungs Arterioles Uterus Skeletal muscle
Dopaminergic	Vasodilation (increased blood flow)	Kidney

*Stimulation of α_2 adrenergic receptors inhibits the continued release of norepinephrine from the pre-synaptic terminal. It is a feedback mechanism that limits the adrenergic response at that synapse. These receptors have no other identified peripheral effects.

- **Sympathetic** fibers primarily affect beta2-receptors through the release of **epinephrine** from the adrenal medulla and the release of **norepinephrine** from the peripheral sympathetic nerves
 - Produces smooth muscle relaxation and **bronchodilation**


- The **beta2-receptor** plays the **dominant** role in bronchial muscle tone
 - Beta1-receptors are also found on bronchial smooth muscle
 - Their **ratio** to beta2 receptors is **1:3**



Bronchodilator Drugs

Bronchodilator Drugs

- Are the primary treatment for obstructive pulmonary diseases such as asthma, chronic bronchitis, and emphysema

- 
- Sympathomimetic Drugs (Beta2 Specific and nonselective sympathomimetics.)
 - Drugs are grouped according to their receptor action

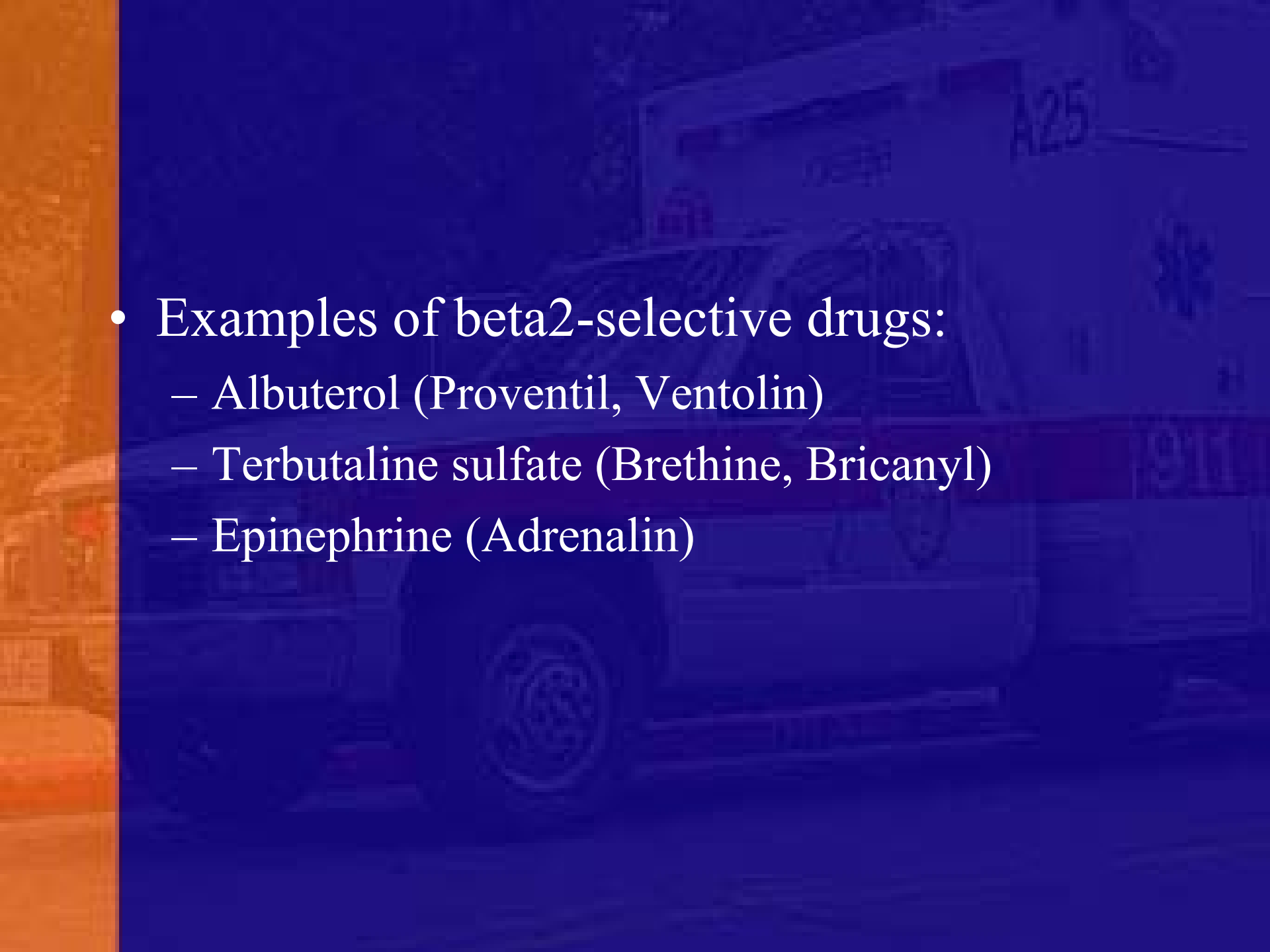
- Nonselective adrenergic drugs have alpha and beta1 (cardiac), and beta2 (respiratory) activities
- *Nonselective beta-adrenergic* drugs have both *beta1* and *beta2* effects
- **Selective beta2-receptor** drugs act primarily on **beta2 receptors in the lungs (bronchial smooth muscle)**

- Nonselective adrenergic drugs stimulate alpha and beta receptors
 - Alpha activity mediates vasoconstriction to reduce mucosal edema
 - Beta2 activity produces bronchodilation and vasodilation
 - Undesirable effects on beta1 receptors include an increase in heart rate and force of contraction

- Undesirable beta2 effects include muscle tremors and CNS stimulation
- Examples:
 - Epinephrine inhalation aerosol (Bronkaid Mist, Primatene Mist)
 - Epinephrine racemic (AsthmaNefrin, microNephrin)

- Nonselective beta-adrenergic drugs are not selective for beta2 receptors and, as a result, have a wide range of effects
- Examples:
 - Epinephrine (Adrenalin) has some alpha activity
 - Ephedrine (Ephed II) has some alpha activity
 - Ethylnorepinephrine (Bronkephrine) has some alpha activity
 - Isoproterenol (Isuprel)

- The selective action of beta2-selective drugs lessens the incidence of unwanted cardiac effects caused by beta1-adrenergic agents
- Better tolerated by patients with hypertension, cardiac disease, or diabetes

- 
- Examples of beta2-selective drugs:
 - Albuterol (Proventil, Ventolin)
 - Terbutaline sulfate (Brethine, Bricanyl)
 - Epinephrine (Adrenalin)

Methylxanthines (Xanthine Derivatives)

- Includes caffeine, theophylline, and theobromine
 - Relax smooth muscle (particularly bronchial smooth muscle)
 - Stimulate cardiac muscle and the CNS
 - Increase diaphragmatic contractility
 - Promote diuresis through increased renal perfusion

- Theophylline products vary in their rate of absorption and therapeutic effects
 - No longer a first-line drug in the treatment of reactive airway disease.
 - Examples of xanthine derivatives:
 - Aminophylline (Amoline, Somophyllin)
 - Dyphylline (Dilor, Droxine)
 - Theophylline (Bronkodyl, Elixophyllin)



Other Respiratory Drugs

Anticholinergics

- Also known as Muscarinic antagonists
 - Ipratropium (Atrovent)
 - Glycopyrrolate (Robinul)

Glucocorticoids

- Aerosol corticosteroid agents
 - Beclomethasone dipropionate (Vanceril Inhaler, Beclovent)
- Injectable corticosteroid agents
 - Dexamethasone (Decadron)

Glucocorticoids (cont.)

- Prophylactic asthmatic agents
 - Not a glucocorticoid but its actions are similar
 - Cromolyn sodium (Intal, Sodium Cromoglycate)
 - Often used as in preventing asthma in adults and children

Leukotriene Antagonist

- Leukotrienes are mediators released from mast cells upon contact with allergens.
 - Contribute powerfully to both inflammation and bronchoconstriction
 - Agents that block their effects are useful in treating asthma
 - Leukotrien antagonist can either block the synthesis of leukotriens or block their receptors

Leukotriene Antagonist (cont.)

- Examples of Leukotriene Antagonist:
 - Zileuton (Zyflo)
 - Blocks Synthesis of leukotrienes.
 - Zafirlukast (Accolate)
 - Blocks leukotriene receptors

Other Respiratory Drugs

- These agents reduce the allergic or inflammatory response to a variety of stimuli.
- In acute care, IV steroids may be given to decrease the inflammatory response and improve air flow
 - Methylprednisolone (Solu-Medrol)



Drugs used for Rhinitis & Cough

Nasal Decongestants

- Caused by dilated and engorged nasal capillaries.
 - Drugs that constrict these capillaries are effective decongestants.
 - The main pharmacologic classification is alpha-1 agonist.
 - When overused, can elevate both the pulse and the blood pressure

Antihistamines

- Histamine is a chemical mediator found in almost all body tissues
 - Concentration is highest in the skin, lungs, and GI tract

Antihistamines

- The body releases histamine when exposed to an antigen such as pollen or insect stings
 - Produces contractile action on bronchial smooth muscle
 - Systemic effects may result in anaphylaxis

Antihistamines

- Antihistamines compete with histamine for receptor sites, preventing the physiological action of histamine
 - H1 receptors act primarily on blood vessels and bronchioles
 - H2 receptors act mainly on the GI tract

Antihistamines

- Antihistamines also have anticholinergic or atropine-like action
 - May result in inhibition of secretions, tachycardia, constipation, drowsiness, and sedation
- Most antihistamines have a local anesthetic effect that may soothe skin irritation caused by an allergic reaction

Antihistamines

- Antihistamines are used primarily for allergic reactions
- Other uses include treatment for motion sickness, sedative or antiemetic

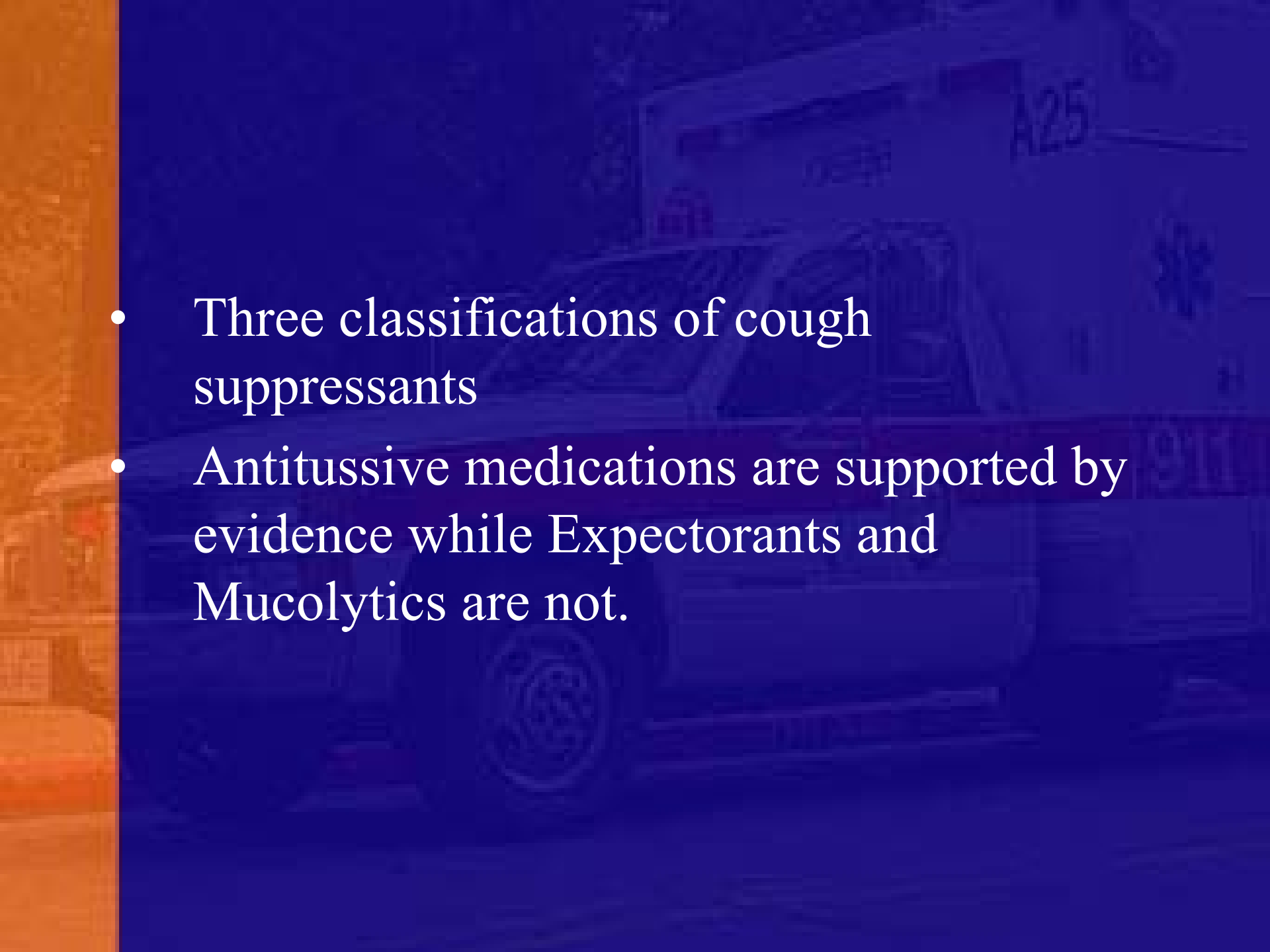
Antihistamines

- Examples of antihistamines:
 - Dimenhydrinate (Dramamine)
 - Diphenhydramine (Benadryl)
 - Hydroxyzine (Atarax)
 - Meclizine (Antivert)
 - Promethazine (Phenergan)



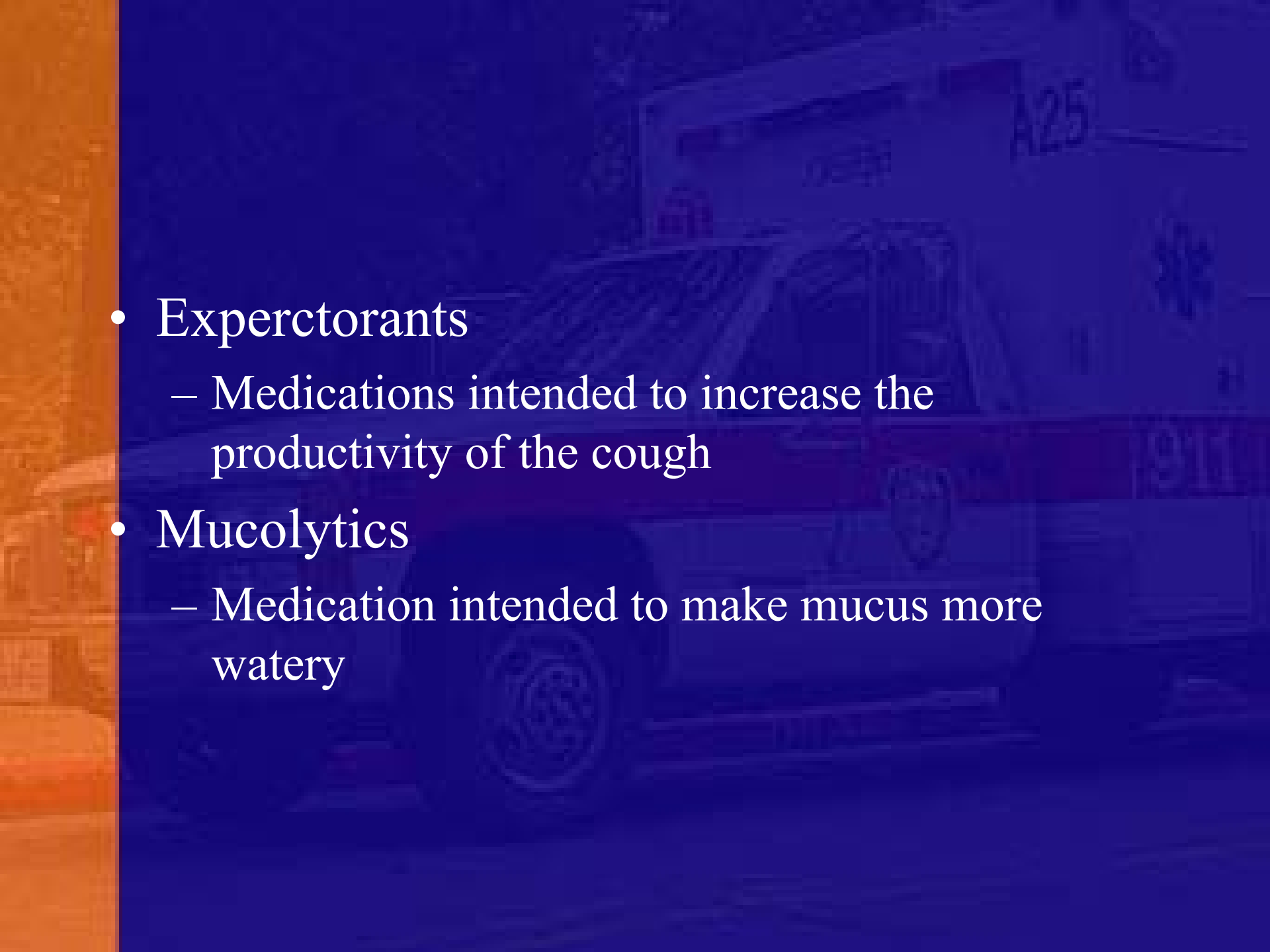
Cough Suppressants

- Coughing is a complex reflex that aids in the removal of foreign particles.
- In general treating a productive cough is not appropriate.
- An unproductive cough usually results from an irritated oropharynx

- 
- Three classifications of cough suppressants
 - Antitussive medications are supported by evidence while Expectorants and Mucolytics are not.

- Antitussive medications.
 - Two most common opioid antitussives are codein and hydrocodone.
 - Both inhibit the stimulus for coughing in the brain.
 - Produces varying degrees of euphoria

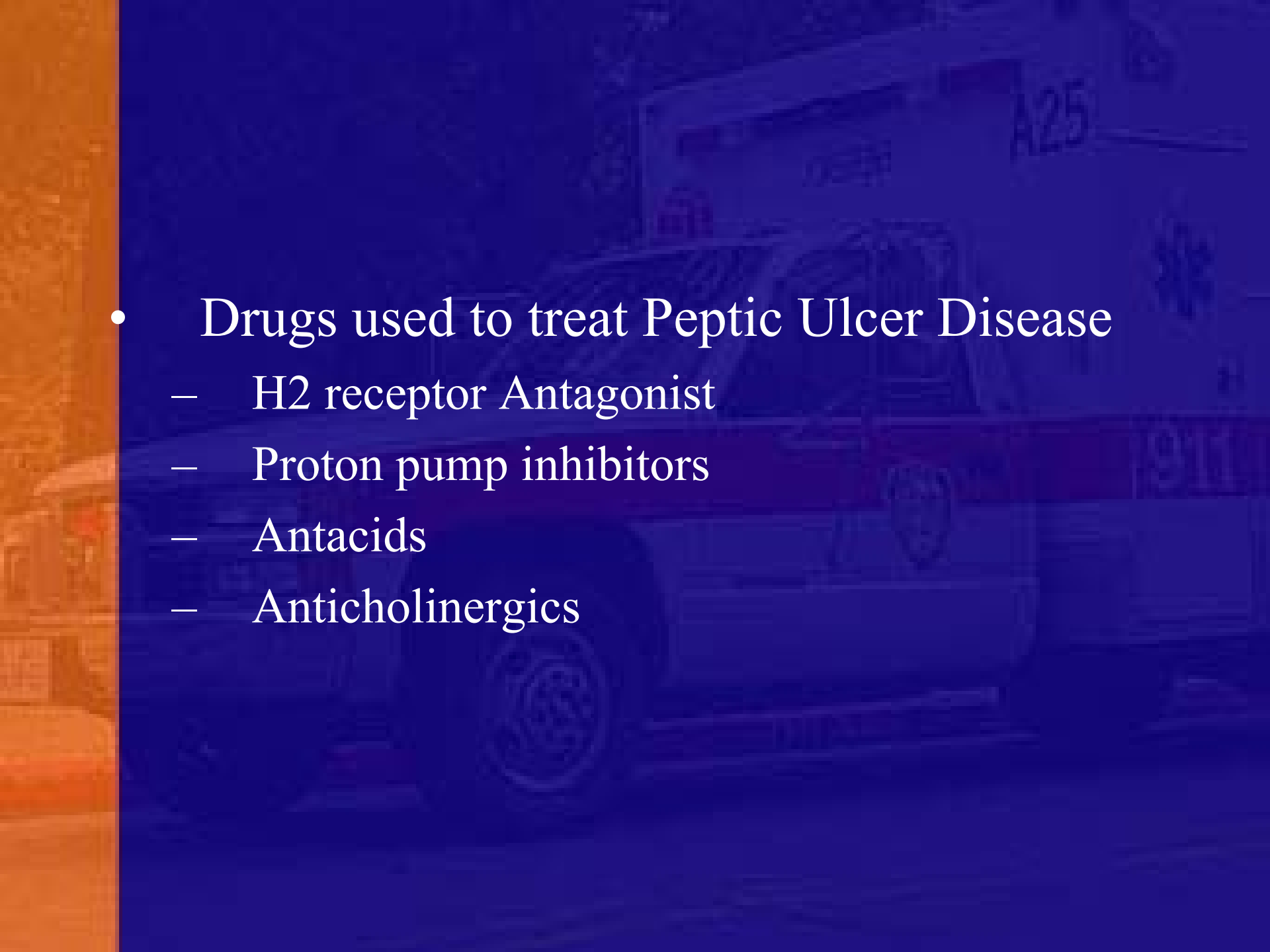
- The non-opioid antitussives do not have the same potential for abuse.
- Examples:
 - Dextromethorphan
 - Used in combination products for treating the cold and flu.
 - Diphenhydramine (Benadryl)
 - Mechanism of action not clear

- 
- Expectorants
 - Medications intended to increase the productivity of the cough
 - Mucolytics
 - Medication intended to make mucus more watery

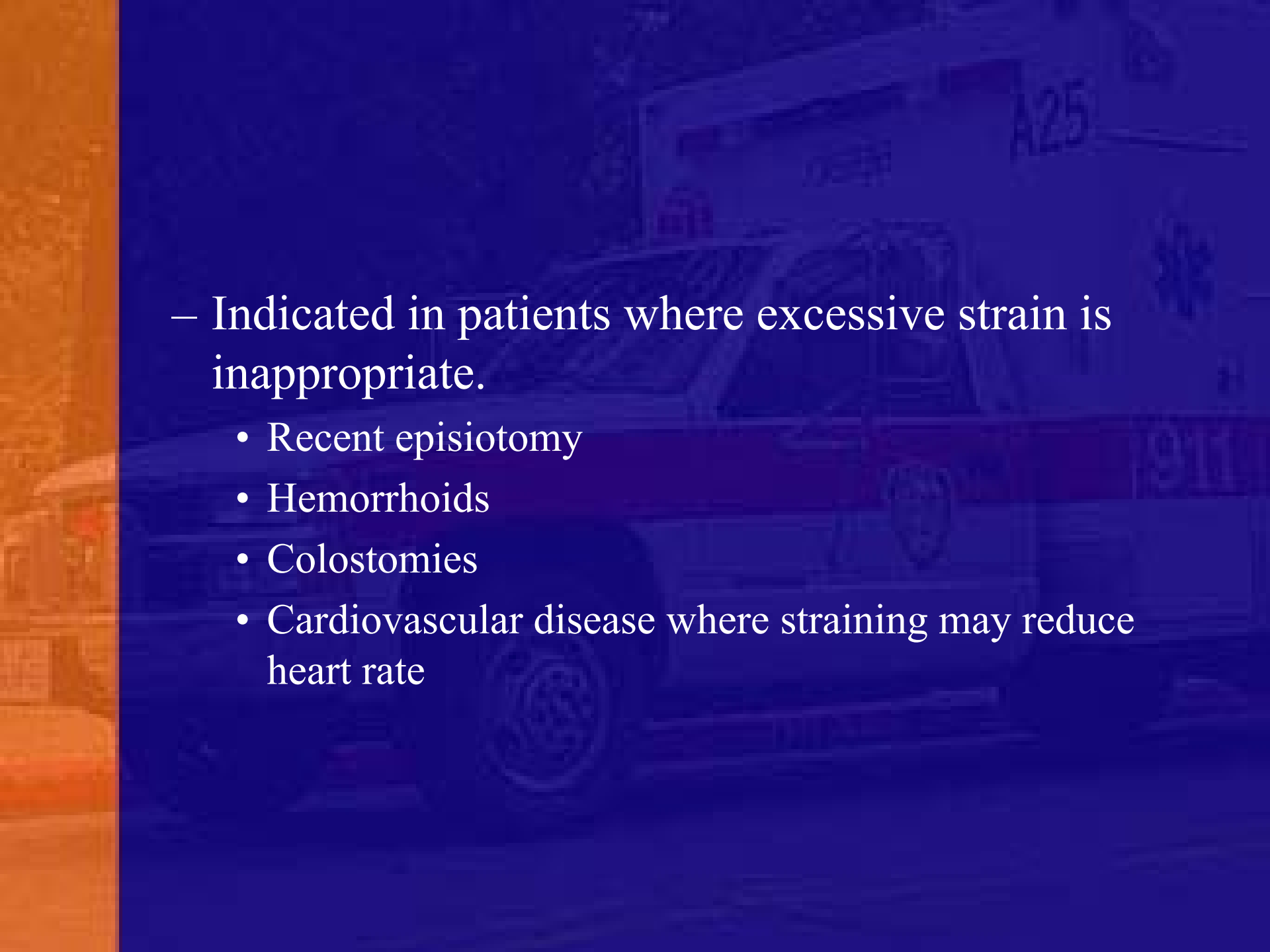


Drugs used to affect the GI Tract

- Main indications of drug therapy in the GI System are to treat peptic ulcers, constipation, diarrhea, and emesis, and to aid digestion

- 
- Drugs used to treat Peptic Ulcer Disease
 - H2 receptor Antagonist
 - Proton pump inhibitors
 - Antacids
 - Anticholinergics

- 
- Drugs used to treat constipation.
 - Laxatives
 - Decrease firmness in stool and increase water content.

- 
- Indicated in patients where excessive strain is inappropriate.
 - Recent episiotomy
 - Hemorrhoids
 - Colostomies
 - Cardiovascular disease where straining may reduce heart rate

Laxatives

- Grouped into four categories
- Bulk forming (Fiber laxatives)
 - Absorbs water leading to a softer more bulky stool

- Surfactant

- Decrease surface tension.
- Increases water absorption into the feces.
- Also increase water secretion and limit its reabsorption by the intestinal wall.
- Example: Docusate sodium (Colace)

- Stimulant

- Increase motility
- Also increase water secretion and decrease reabsorption.
- Example: Phenolphthalein (Ex-Lax, Correctol)

- Osmotic
 - Poorly absorbed salts that increase osmotic pull of feces thereby increasing their water content.
 - Example: Magnesium hydroxide. (The active ingredient in Milk of Magnesia)

Drugs used to treat Diarrhea

- Diarrhea is usually a helpful process because it increases the expulsion of the offending agent.
- Usually is self correcting.
- When treatment is necessary, either specific or nonspecific agents may be used
- Specific agents directly treats the cause.
 - Usually a bacteria.
 - Antibiotics are common specific antidiarrheal

Drugs used to treat Emesis

- Emesis involves different parts of the brain as well as receptors and muscles in the stomach and inner ear.

- In the brain:
 - The vomiting center in the medulla.
 - Stimulates vomiting directly.
 - Stimulated by H1 and Ach receptors in the pathway between itself and the inner ear

- Chemoreceptor Trigger Zone. (CTZ)
 - Stimulates the vomiting center in response to stimuli from serotonin receptors in the stomach and blood borne substances such as opioids and ipecac.

Antiemitics

- Indicated in conjunction with chemotherapy.
- Also in prophylactic treatment of motion sickness.

- Multiple transmitters are involved in the vomiting reflex.
 - Serotonin
 - Dopamine
 - Acetylcholine
 - Histamine
- Drugs that interfere with any of these transmitters can reduce nausea and vomiting.

Serotonin Antagonists

- Blocks Serotonin receptors in the CTZ, the stomach and small intestines.
 - Very effective in treatment of nausea associated with chemotherapy.
 - Most common side effect is headache and diarrhea

Dopamine Antagonists

- Block dopamine receptors in the CTZ.
 - Haloperidol (Haldol)
 - Droperidol (Inapsine)
 - Phenothiazines
 - Prochlorperazine (Compazine)
 - Promethazine (Phenergan)
- Both classes cause extrapyramidal side effects

Cannabinoids



- Derivatives of tetrahydrocannabinol (THC)
 - The active ingredient in marijuana
- Effective antiemetics used to treat chemo-therapy induced Nausea and vomiting
 - Two available agents:
 - Dronabinol (Marinol)
 - Nabilone (Cesamet)

Drugs used to Aid Digestion

- Similar to endogenous digestive enzymes
 - Examples:
 - Pancreatin (Entozyme)
 - Pancrelipase (Viokase)
 - Side effects are nausea, vomiting and abdominal cramping

Drugs used to affect the eyes



- Ophthalmic drugs are used to treat conditions involving the eyes, primarily glaucoma and trauma.
- Medications used to treat glaucoma are aimed at reducing intraocular pressure (IOP)

- Beta blockers are most common.
- Decreases IOP by an unknown mechanism.
 - Examples:
 - Timolol (Timoptic)
 - Betaxolol (Betoptic)

- Pilocarpine (Isopto Carpine)
 - Stimulates muscarinic receptors in the eye to cause miosis (pupil constriction) and ciliary contraction which reduces IOP.
 - Causes blurred vision and local irritation


Medications for trauma and procedures

- Tetracain (Pontocaine)
 - Local anesthetic of the ester class.
 - Related to cocaine, an ester but not to Lidocaine, an amide.
 - Used to decrease pain and sensation in the eye from trauma or during ophthalmic procedures.
 - Caution the patient not to rub his/her eyes because they may worsen the injury



Drugs used to affect the ears

- Most drugs are aimed at eliminating underlying bacterial or fungal infections or at breaking up impacted ear wax.
 - Common Antibiotics
 - Chloramphenicol (Chloromycetin Otic)
 - Gentamicin sulfate otic solution (Garamycin)

- 
- Ear Wax removal
 - Carbamide peroxide (Auro Ear Drops)
 - Carbamide peroxide and glycerin (Ear Wax Removal System)

- Some drugs used for other purposes have ototoxic (harmful to the organs or nerves that produce hearing or balance) properties if overdosed or taken too quickly
 - Aspirin and other NSAIDs
 - Some antibiotics including erythromycin and vancomycin.
 - Furosemide (Lasix)

- Most common ototoxic symptom is tinnitus





Drugs used to affect the endocrine system

Hormones

- The endocrine system transmits information to various regions in the body via blood-borne hormones
- Hormones act after secretion in the blood stream from endocrine glands

Hormones

- Hormones work together to regulate vital processes, including:
 - Secretory and motor activities of the digestive tract
 - Energy production
 - Composition and volume of extracellular fluid
 - Adaption (such as acclimatization and immunity)

Hormones

- Growth and development
- Reproduction and lactation

Drugs Affecting the Parathyroid and Thyroid Glands

- Parathyroid glands are primarily responsible for regulating calcium levels
- Thyroid gland produces thyroid hormones
 - Plays a vital role in regulating growth, maturation and metabolism

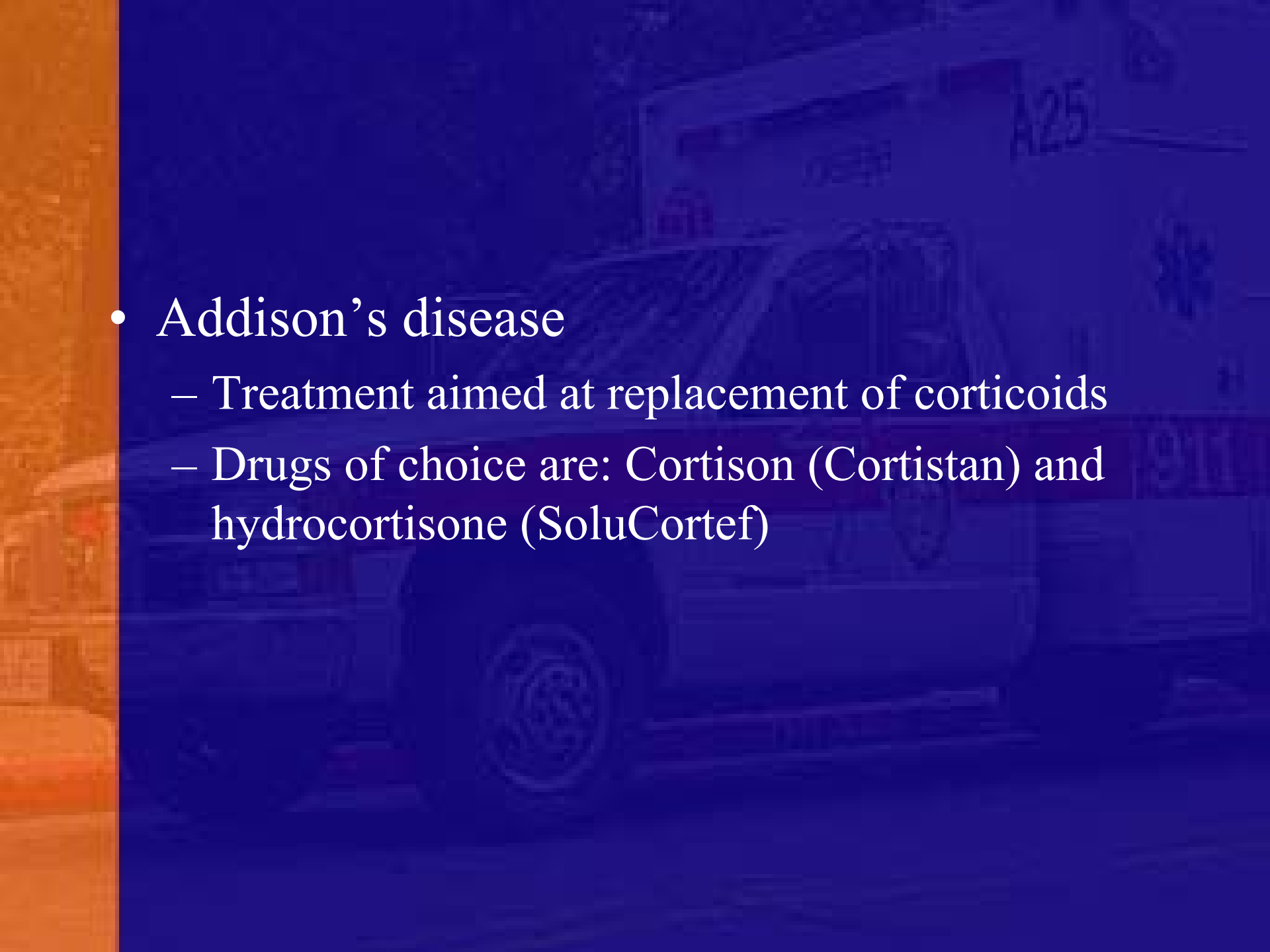
- Treatment is aimed at thyroid hormone replacement
 - Levothyroxine (Synthroid)
 - A synthetic analogue of T4 (thyroxine)
 - Overdoses can lead to thyrotoxicosis or thyroid storm

Hyperthyroidism

- Caused by excessive release of thyroid hormones
- Typically as a result of tumors
- Most common cause is Graves Disease
- Treatment is typically surgical
 - Propylthiouracil (PTU) may be given

Drugs Affecting the Adrenal Cortex

- Two diseases typify the disorders associated with the adrenal cortex
- Cushing's disease
 - Treatment is usually surgical
 - Symptomatic pharmacologic intervention with antihypertensive (potassium sparing diuretics such as spironolactone [Aldactone] or ACE inhibitors such as captopril [Capoten]) may be necessary

- 
- Addison's disease
 - Treatment aimed at replacement of corticoids
 - Drugs of choice are: Cortison (Cortistan) and hydrocortisone (SoluCortef)



Drugs Affecting the Pancreas

- The pancreas is an exocrine gland and an endocrine gland
 - The endocrine portion produces the hormones that enter the circulatory system
- Hormones of the Pancreas
 - Play an important role in regulating the concentration of certain nutrients in the circulatory system

- ## Insulin

- The primary hormone that regulates glucose uptake by the cells
- Increases the ability of the liver, adipose tissue, and muscle to take up and use glucose
 - Glucose not immediately needed as an energy source is stored in the skeletal muscle, liver, and other tissues as glycogen

- Glucagon

- Primarily influences the liver with some effect on skeletal muscle and adipose tissue
- Stimulates the liver to break down glycogen so that glucose is released into the blood
- Inhibits the uptake of glucose by muscle and fat cells

The balancing action of these two hormones protect the body from hyperglycemia and hypoglycemia

Metabolic derangements can occur in diabetes mellitus

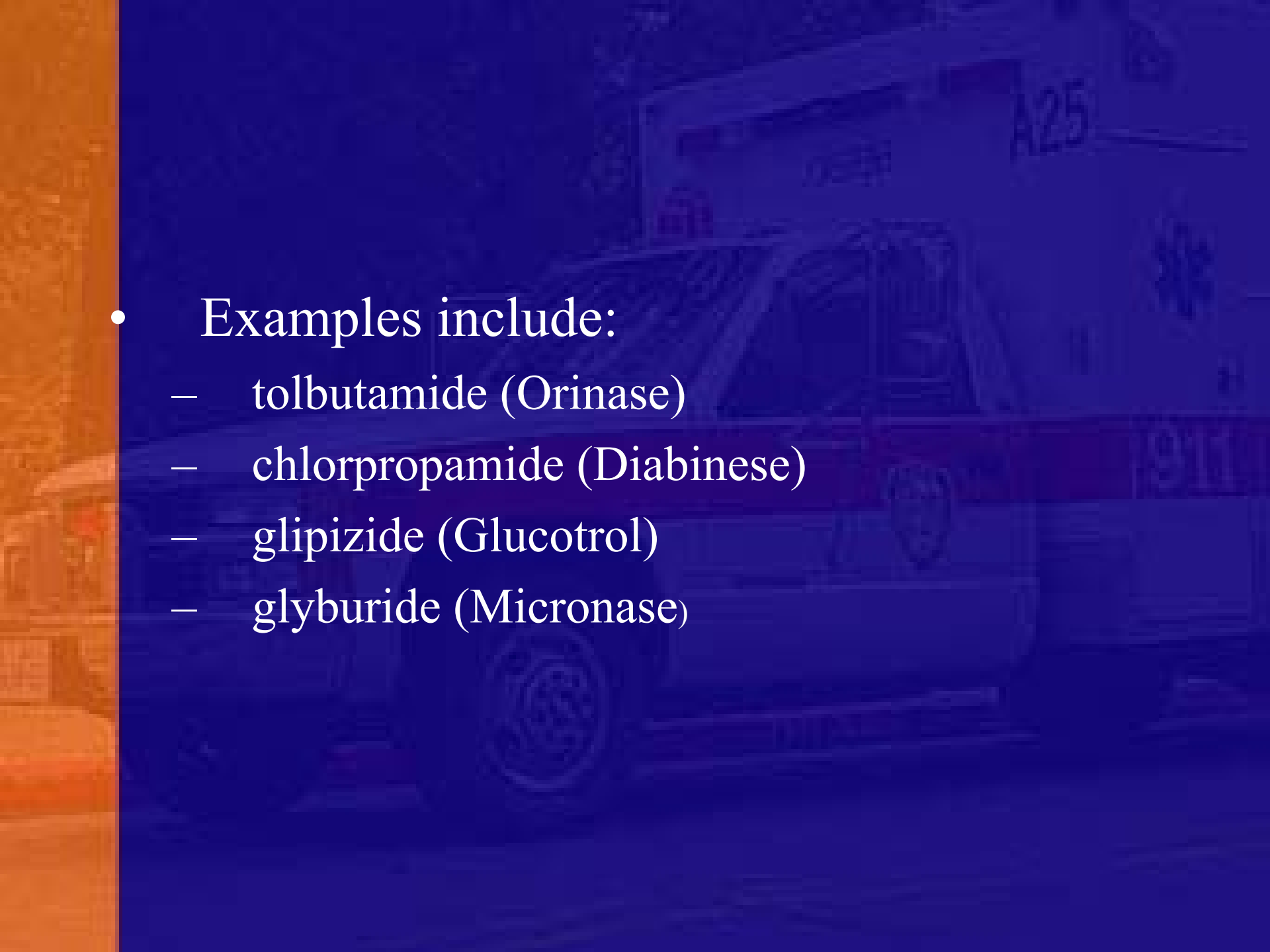
- Insulin Preparations
 - Comes from one of three sources
 - Beef
 - Pork
 - Synthetic
 - May be classified as natural (regular) or modified to increase their duration

Oral Hypoglycemic Agents

- Used to stimulate insulin secretion from the pancreas in patients with NIDDM.
- Ineffective in people with Type I diabetes.
- Four pharmacologic classes :

Sulfonylureas

- First class of oral hypoglycemics available.
- AKA First or second generation depending on when they were released.
- They work by increasing tissue response to insulin.
- Major side effect is hypoglycemia

- 
- Examples include:
 - tolbutamide (Orinase)
 - chlorpropamide (Diabinese)
 - glipizide (Glucotrol)
 - glyburide (Micronase)

Biguanides

- Decreases glucose synthesis and increases glucose uptake.
- Does not stimulate the release of insulin from the pancreas

Alpha-glucosidase inhibitors

- Delay carbohydrate metabolism.
- Examples:
 - acarbose (Precose)
 - miglitol (Glyset)

Thiazolidinediones

- New Class of oral hypoglycemic agents unrelated to the others.
 - Works by promoting tissue response to insulin making the available insulin more effective.
 - The only drug in this class is troglitazone (Rezulin)
 - No major side effects

Hyperglycemic Agents

- Act to increase blood glucose levels
 - Glucagon
 - Indicated for emergency treatment of hypoglycemia.
 - Frequently given IM
 - Occasional side effects are nausea and vomiting, and rarely, allergic reactions

Dextrose 50% (D50W)

- Dilute D50 to D25 for administration to pediatric patients or D10 for infants.
- Primary side effect is tissue necrosis if infiltration occurs



Drugs affecting the female reproductive system

Estrogens and Progestins

- Principle indication of estrogen is replacement therapy.
- Conflicting data regarding risk verses benefits.
- Side effects include, nausea, fluid retention, and breast tenderness

Oral Contraceptives

- Prevents ovulation.
- Second most popular means of birth control.
- Many different preparations.
- May be classified by their administration cycle.
 - Monophasic
 - Biphasic
 - Triphasic

Uterine Stimulants and relaxants

- Uterine stimulants
 - Also known as oxytocics (meaning rapid birth)
 - Administered to induce labor and to treat postpartum hemorrhage.
 - Oxytocin is available commercially as Pitocin and Syntocinon.
 - Side effect: Water Retention.

Uterine relaxants

- Also known as tocolytics.
- Acts by stimulating beta-2 receptors in the uterus.
- The two beta-2 agonists commonly used for this purpose are:
 - Terbutaline (Brethine)
 - Ritodrine (Yutopar)

Infertility Agents

- Are developed for women and promote maturation of ovarian follicles.
- Examples:
 - Clomiphene (Clomid)
 - Urofollitropin (Metrodin)
 - Menotropins (Pergonal)
- Each act by a different mechanism

Infertility Agents (cont.)

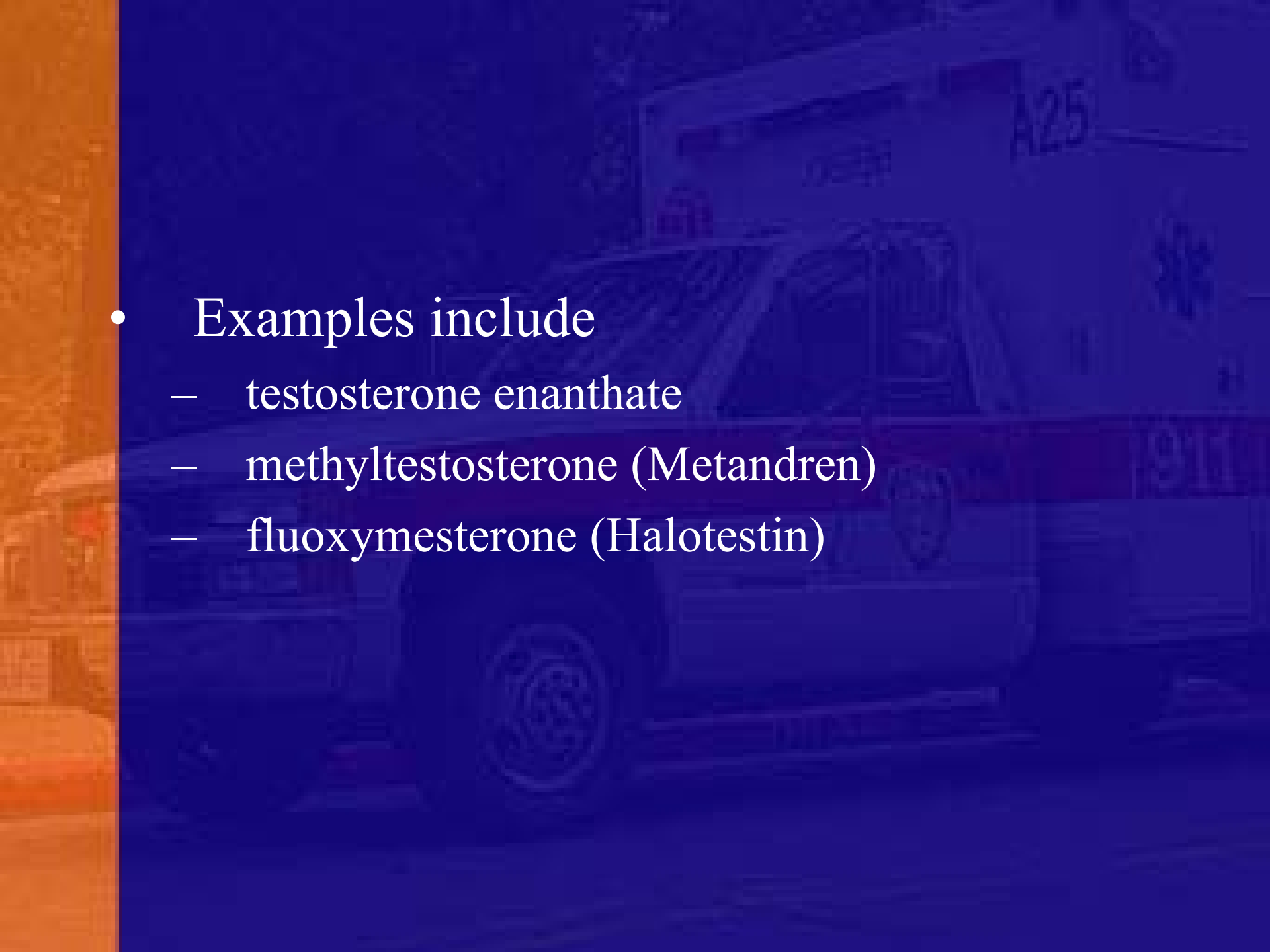
- These agents' side effects include:
 - Ovarian enlargement or cyst
 - Abdominal pain
 - Menstrual irregularities



Drugs Affecting the Male reproductive system

Drugs Affecting the Male reproductive system

- Includes drugs that treat testosterone deficiency and benign prostatic hyperplasia
- Testosterone replacement therapy may be indicated in deficiency caused by:
 - Cryptorchidism (failure of one or both of the testes to descend during puberty)
 - Orchitis (testicular inflammation)
 - Orchiectomy (testicular removal)
 - Also may be used in delayed puberty

- 
- Examples include
 - testosterone enanthate
 - methyltestosterone (Metandren)
 - fluoxymesterone (Halotestin)

Benign prostatic hyperplasia

- Enlarged prostate.
- Common age-related disease.
- Several drugs available
 - Finasteride (Proscar)
- Side effects include:
 - Rash/Breast tenderness/Headache
 - Impotence/Decreased libido

The background of the slide features a faded, blue-tinted image of a police truck. The truck is a large, white cab model with a dark-colored body. On the side of the cab, the number 'A25' is visible. Below the cab, the number '911' is printed. The truck is parked on a street, and the overall image is semi-transparent, allowing the text to be clearly visible.

Drugs Affecting Sexual Behavior

- Many drugs decrease libido. Mostly as a side effect
- Examples include:
 - Antihypertensives (beta-blockers, centrally acting alpha antagonists, and diuretics)
 - Antianxiety/antipsychotic medications (benzodiazepines, phenothiazines, MAO inhibitors and tricyclic antidepressants).

- Many drugs are said to increase libido.
 - Most notable is cantharis (Spanish fly).
 - LSD, marijuana and alcohol also believed to heighten sexuality.
 - Most likely an indirect result of decreased inhibitions.
- Have no proven direct physiological effect on sexual gratification

Levodopa (L-dopa)

- Has demonstrated increased libido and improved erectile ability as a side effect of treatment.

Sildenafil (Viagra)

- Approved in 1998 for pharmacologic therapy.
- Acts by relaxing vascular smooth muscle, which increases blood flow to the corpus cavernosum. (The sponge like tissue on the sides of the penis).
- Has no effect in the absence of sexual stimulation

Sildenafil (Viagra) (cont.)

- Chief side effect seen when used in combination with nitrates.
 - Combined effect of relaxing vascular smooth muscle may lead to a dangerously decreased preload leading to myocardial infarction.
- Do not give nitroglycerin to patients who have recently taken sildenafil
- Mississippi Medicaid spent \$5.5 million for Viagra during FY 2000-2001

Drugs used to treat cancer



- Called antineoplastic agents.
- Grouped according to their mechanism of action

Antimetabolite drugs

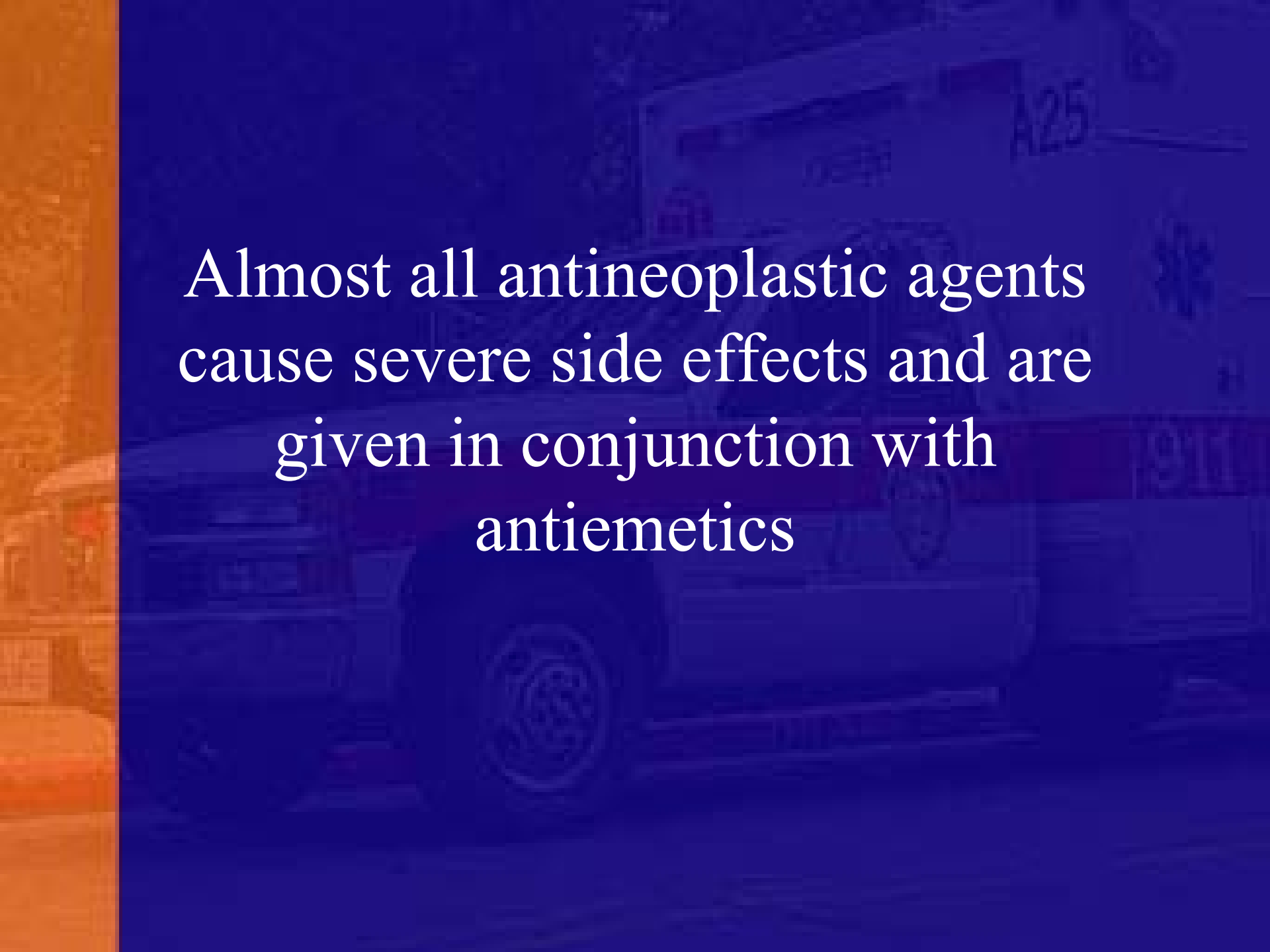
- Mimic some enzymes and proteins needed for DNA production but do not have the same effects.
- Therefore they prevent cells from reproducing.
- Prototype drug is fluorouracil (Adrucil).

Alkylating agents

- Interfere with DNA splitting.
- Examples:
 - Cyclophosphamide (Cytosan)
 - Mechlorethamine (Mustargen)

Mitotic inhibitors

- Interfere with cell division.
- Examples:
 - Vinblastine (Velban)
 - Vincristine (Oncovin)



Almost all antineoplastic agents
cause severe side effects and are
given in conjunction with
antiemetics

The background of the slide is a dark blue overlay on a photograph of an ambulance. The ambulance is white with red and blue emergency lights on top. The number 'A25' is visible on the side of the ambulance, and '911' is visible on the front. The ambulance is parked on a street.

Drugs used to treat Infectious Diseases and Inflammation

Antibiotics

- May either kill the offending bacteria (bactericidal agents) or decrease the bacteria's growth to the point that the body's immune system can effectively fight the infection (bacteriostatic agents).

Antibiotics (cont.)

- In general, all share one of several mechanisms.
 - Bactericidal agents act by inhibiting cell wall synthesis of the bacteria cell.
 - Osmotic pressure pulls water into the cell causing cell rupture.
- Includes the penicillin and cephalosporin classes as well as vancomycin (Vancocin)

Antifungal and Antiviral Agents

- Fungal infections (mycoses) may be treated with several drugs.
- Azole antifungals inhibit fungal growth.
 - Prototype drug is ketoconazole (Nizoral)

Antifungal and Antiviral Agents (cont.)

- Drugs used to treat viruses work by a variety of mechanisms.
 - Includes acyclovir (Zovirax) and zidovudine (Retrovir)
 - Commonly known as AZT
- Protease inhibitors are one of the more promising classes for treating viruses such as HIV.
 - Prototype drug, Indinavir (Crixivan)

Other Antimicrobial and Antiparasitic Agents

- Schizonticides
 - Includes:
 - Chloroquine (Aralen)
 - Mefloquine (Lariam)
 - Quinine
- Antiparasitics used to treat Malaria

Other Antimicrobial and Antiparasitic Agents (cont.)

- Treatment is aimed at either preventing infestation or killing the parasites in infected patients

Drug commonly used to treat tuberculosis

- Includes:
 - Isoniazide (Nydrazid, INH)
 - Rifampin (Rifadin)

Drugs used to treat amebiasis

- A parasitic infection of the intestines common in tropical areas.
- Includes:
 - Paromomycin (Humatin)
 - Metronidazole (Flagyl)

Drugs to treat helminthiasis

- Caused by parasitic worms
- Including flatworms and roundworms.
- Treatment is aimed at killing the organism or destroying its ability to latch to the intestinal wall.
- Examples:
 - Mebendazole (Vermox)
 - Niclosamide (Niclocide)

Drugs used to treat Hansen's Disease (Leprosy)

- Caused by bacteria.
- Leads to lesions, footdrop (plantar flexion) and plantar ulceration.
- Examples:
 - Dapsone (DDS, Avlosulfon)
 - Clofazimine (Lamprene)

Nonsteroidal Anti-Inflammatory Drugs

- Commonly used as analgesics and antipyretics (fever reducers)
- Including acetaminophen and ibuprofen.
- Other NSAIDS include
 - ketorolac (Toradol)
 - piroxicam (Feldene)
 - naproxen (Naprosyn)

Uricosuric Drugs

- Used to treat and cure acute episodes of gout.
- Includes colchicines and allopurinol (Zyloprim)

Serums, Vaccines, and Other Immunizing Agents

- Serums and vaccines may augment the immune system.
- A serum is a solution containing whole antibodies for a specific pathogen

Serums, Vaccines, and Other Immunizing Agents (cont.)

- A vaccine contains a modified pathogen that does not actually cause the disease but stimulates the development of antibodies.
 - These pathogens may be either dead or attenuated (having a decreased disease causing ability).

Immune Suppressing and enhancing agents

- Can either suppress the immune system (immunosuppressants) or enhance it (immunomodulators).
- Suppressing the immune system is indicated to prevent the rejection of organs transplanted

Immune Suppressing and enhancing agents (cont.)

- Commonly used: Azathioprine (Imuran)
 - Acts by decreasing cell mediated reactions and suppressing antibody production.

Drugs used to affect the skin



- Used to treat skin irritations
- Many different general preparations.
- Include:
 - Baths/soaps/solutions/cleansers
 - emollients (Lubriderm, Vaseline)
 - skin protectants (Benzoin)
 - wet dressings or soaks (Domeboro Powder)
 - rubs and liniments (Ben-Gay, Icy Hot)

Drugs used to supplement the diet

Dietary supplements can help to maintain needed levels of these essential nutrients and fluids

Vitamins & Minerals

- Are inorganic compounds necessary for different physiologic processes
 - Metabolism/Growth/Development
 - Tissue Repair
- Most are absorbed in the GI tract

Vitamins & Minerals (cont.)

- Vitamins are either fat or water soluble.
- Fat soluble vitamins
 - A, D, E, and K.
 - Stored by the liver.

Vitamins & Minerals (cont.)

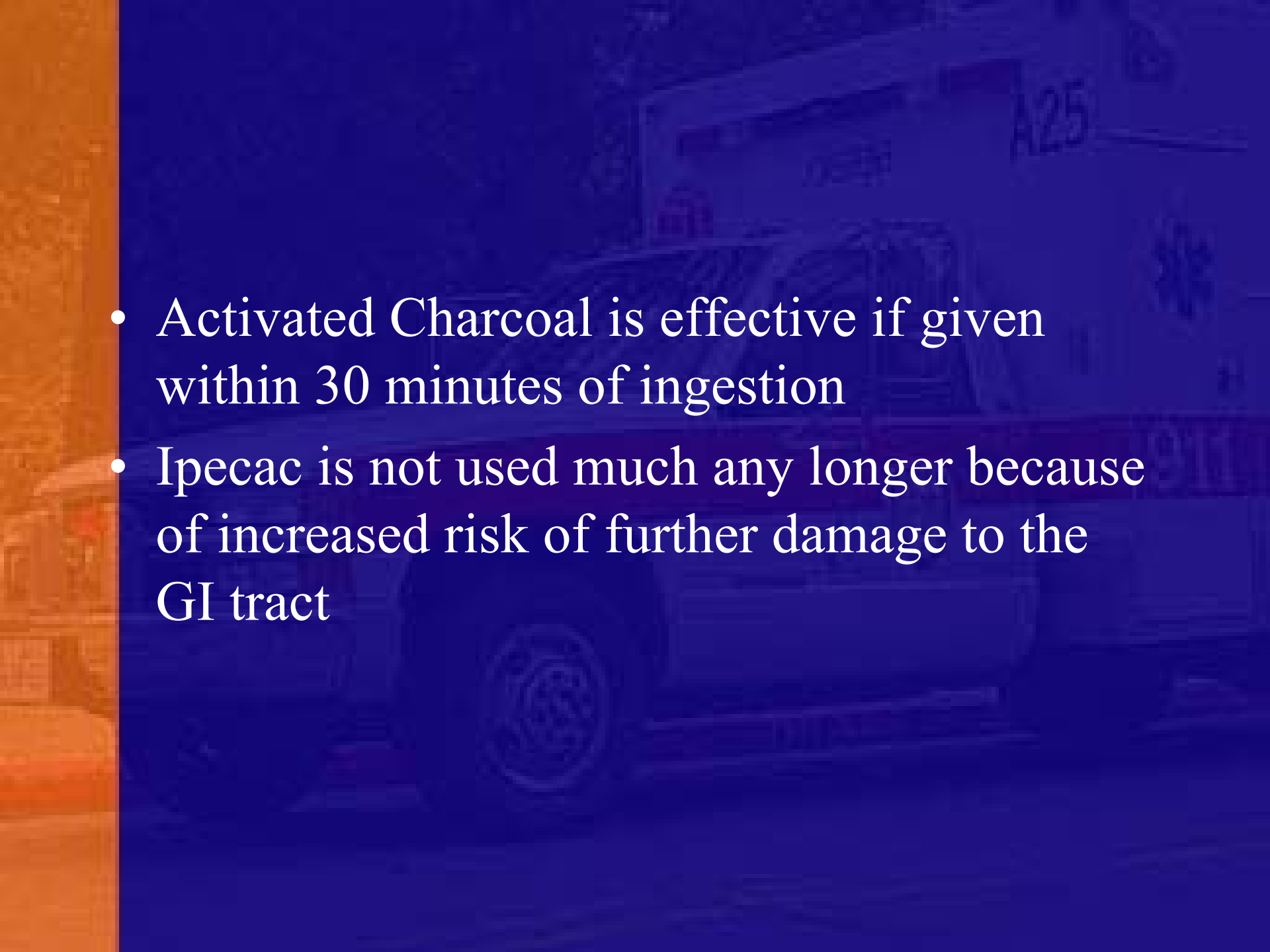
- Water soluble vitamins
 - C and those in the B complex
 - B1 is also known as Thiamin
- Essential minerals
 - Most common supplements are Iron.
 - Necessary for oxygen transport.



Drugs used to treat poisoning and overdoses

- Treatment depends on the substance involved.
- In general, therapy aims at eliminating the substance by emptying the gastric contents
- Actual antidotes are few.
- Some medications are effective in treating certain overdose or poisonings

- General mechanism for antidote action include:
 - Receptor site antagonism, blocking enzyme actions involved with metabolism of the substance.
 - Chelation (binding the substance with a stable compound such as iron so that it becomes inactive).

- 
- Activated Charcoal is effective if given within 30 minutes of ingestion
 - Ipecac is not used much any longer because of increased risk of further damage to the GI tract